[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 33

[Docket No. FAA-2012-1085; Special Conditions No. 33-013-SC]

Special Conditions: Turbomeca Ardiden 3K Turboshaft Engine.

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special condition.

SUMMARY: We are issuing these special conditions for the Turbomeca Ardiden 3K model engines. This engine model will have a novel or unusual design feature that is a 30-minute all engines operating (AEO) power rating for hovering at increased power (HIP). This rating is primarily intended for high-power hovering operations that are normal mission functions. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the FAA considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: The effective date of these special conditions is **[insert a date 30 days after date of publication in the Federal Register].**

FOR FURTHER INFORMATION CONTACT: For technical questions concerning these special conditions, contact Tara Fitzgerald, ANE-111, Engine and Propeller Directorate, Aircraft Certification Service, 12 New England Executive Park, Burlington, Massachusetts 01803-5299; telephone: (781) 238-7130; facsimile: (781) 238-7199; e-mail: tara.fitzgerald@faa.gov. For legal questions concerning these special conditions, contact Vincent Bennett, ANE-7 Engine and

Propeller Directorate, Aircraft Certification Service, 12 New England Executive Park, Burlington, Massachusetts 01803-5299; telephone: (781) 238-7044; facsimile: (781) 238-7055; e-mail: vincent.bennett@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

On September 15, 2010, Turbomeca S.A. (Turbomeca) applied for a type certificate for their new Ardiden 3K turboshaft engine**.** The Ardiden 3K engine is the first variant in the new Ardiden 3 series. This engine incorporates a two-stage centrifugal compressor that is driven by a single-stage high-pressure turbine. A two-stage power turbine drives the engine output shaft. The control system includes a dual-channel full-authority digital-electronic control.

The engine will incorporate a novel or unusual design feature, which is a 30-minute hovering at increased power (HIP) rating. The applicant requested this rating to support extended hover operations at high power.

Special conditions are necessary to apply additional requirements for rating definition, instructions for continued airworthiness (ICA), instrumentation, and endurance testing because the applicable airworthiness standards do not contain adequate or appropriate airworthiness standards to address this design feature. The ICA requirement addresses the unknown nature of actual rating usage and associated engine deterioration. The applicant is expected to assess the expected usage, and publish ICA and Airworthiness Limitations Section limits in accordance with those assumptions, such that engine deterioration is not excessive. The instrumentation requirement is to ensure that operators use this high-power rating within its limits, and that engine integrity is maintained. The endurance test requirement of 25 hours operation at 30-

minutes HIP is similar to other special conditions recently issued. Because the Ardiden 3K model has a continuous one engine inoperative (OEI) rating with limits equal to or higher than the proposed 30-minute HIP rating, the applicant may credit the test time performed at the continuous OEI rating toward the 25-hour requirement. However, test time spent at other rating elements of the test, such as takeoff or other OEI ratings (that are equal to or higher than HIP rating values), cannot be counted toward the 25 hours of required running.

These special conditions contain the additional airworthiness standards necessary to establish a level of safety equivalent to the level intended by the applicable standards of airworthiness in effect on the date of application.

Type Certification Basis

Under the provisions of 14 CFR §§ 21.17 and 21.101(a), Turbomeca must show that the model Ardiden 3K turboshaft engine meets the provisions of the applicable regulations in effect on the date of application, or later amendment if so elected. Accordingly, the certification basis for the Ardiden model turboshaft engine is determined to be part 33, effective February 1, 1965, as amended by Amendments 33-1 through 33-31.

If because of a novel or unusual design feature, we find that the applicable airworthiness regulations in part 33, as amended, do not contain adequate or appropriate safety standards for the Turbomeca model Ardiden 3K turboshaft engine, special conditions are prescribed under the provisions of § 21.16.

We issue special conditions, as defined by 14 CFR 11.19, under 14 CFR 11.38, which become part of the type certification basis as specified in § 21.17(a)(2).

Special conditions are initially applicable to the model for which they are issued. If the type certificate for that model is amended later to include another related model that incorporates the same or similar novel or unusual design feature, or if any other model already included on the same type certificate is modified to incorporate the same or similar novel or unusual design feature, the special conditions would also apply to the other model.

Novel or Unusual Design Features

The Turbomeca model Ardiden 3K turboshaft engine will incorporate a 30-minute HIP rating, for use up to 30 minutes at any time between take-off and landing. The 30-minute time limit applies to each instance the rating is used. However, there is no limit to the number of times the rating can be used during any one flight and there is no cumulative time limitation. These special conditions for a 30-minute HIP rating apply to address this novel and unusual design feature.

Discussion of Comments

A notice of proposed special conditions, Notice 33-12-02-SC for the Turbomeca model Ardiden 3K turboshaft engine was published on November 8, 2012 (77 FR 66936). We received no comments.

Applicability

These special conditions are applicable to Turbomeca model Ardiden 3K turboshaft engines. If Turbomeca applies later for a change to the type certificate to include another closely related model incorporating the same novel or unusual design feature, these special conditions

would apply to that model as well. This is true, if the certification basis is the same or contains later amendments that satisfy the certification basis discussed in the section titled "Type Certification Basis."

Conclusion

We reviewed the available data and have determined that air safety and the public interest require adopting these special conditions as proposed. This action affects certain novel or unusual design features on the Turbomeca Model Ardiden 3K turboshaft engine. It is not a rule of general applicability, and applies only to Turbomeca, that requested FAA approval for these engine features.

List of Subjects in 14 CFR part 33

Air transportation, Aircraft, Aviation safety, Safety.

The authority citation for these special conditions continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701–44702, 44704.

The Special Conditions

Accordingly, the FAA issues the following special conditions as part of the type certification basis for the Turbomeca model Ardiden 3K turboshaft engine.

1. Part 1 Definitions.

Unless otherwise approved by the Administrator and documented in the appropriate manuals and certification documents, the following definition applies to these special conditions: **"**Rated 30-Minute Hover at Increased Power (HIP)," means the approved shaft horsepower developed under static conditions at the specified altitude and temperature, and within the

operating limitations established under part 33, and limited in use to periods not exceeding 30 minutes.

2. Part 33 Requirements.

(a) Sections 33.1 Applicability and 33.3 General. As applicable, all documentation, testing and analysis required to comply with the part 33 certification basis must account for the 30-minute HIP rating, limits, and usage.

(b) Section 33.4, Instructions for Continued Airworthiness (ICA). In addition to the requirements of § 33.4, the ICA must:

(1) Include instructions to ensure that in-service engine deterioration due to rated 30-minute HIP usage will not be excessive, meaning that all approved ratings, including One Engine Inoperative (OEI), are available (within associated limits and assumed usage) for each flight; and that deterioration will not exceed that assumed for declaring a Time Between Overhaul period.

(2) Validate the adequacy of the maintenance actions required under paragraph (b)(1) above.

(3) Include in the Airworthiness Limitations section, any mandatory inspections and serviceability limits related to the use of the 30-minute HIP rating.

(c) Section 33.29, Instrument Connection. The engine must have a means or a provision for a means, which alerts the pilot when the 30-minute HIP rating time limit has expired.

(d) Section 33.87, Endurance Test. In addition to the applicable requirements of §§ 33.87(a), 33.87(d) and 33.87(e) (for engines that combine 2.5 minute and continuous OEI ratings):

(1) The overall test run must include a minimum of 25 hours of operation at 30-minute HIP rating and limits, divided into periods of not less than 30 minutes but not more than 60 minutes, with alternate periods at maximum continuous power or less.

(2) Each § 33.87(d)(3) continuous OEI rating test period of 60 minutes duration run at power and limits equal to or higher than the 30-minute HIP rating, may be credited toward this requirement. Note that you may not count the test time required for the takeoff or other OEI ratings toward the 25 hours of testing required at the 30-minute HIP rating.

Issued in Burlington, Massachusetts on March 5, 2013.

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